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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/657,451 | 09/08/2003 | William P. Parker | B6603-0003 | 1455 |
| 7590 | 08/11/2004 | | EXAMINER | |
| James Marc Leas 37 Butler Drive S. Burlington, VT 05403 | | | JUBA JR, JOHN | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2872 | |

DATE MAILED: 08/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/657,451

Applicant(s)

PARKER ET AL.

Examiner

John Juba, Jr.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26, 35, 36, 45-48 and 50-89 is/are pending in the application.
- 4a) Of the above claim(s) See Continuation Sheet is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5, 20/2, 70, 71, 72, 74 and 75 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 73, 76 and 78 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>9/8/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

Continuation of Disposition of Claims: Claims withdrawn from consideration are 6-19, 20/7, 20/12, 20/17, 21-26, 35, 36, 45-48, 50-69, 77, & 79-89.

DETAILED ACTION***Election/Restrictions***

Applicant's election without traverse of Group I, species A in the reply filed on May 20, 2004 is acknowledged. Applicants note that claim 81 should not be grouped with the elected invention. Thus, claim 81 is withdrawn as being directed to a non-elected invention. Applicants mistakenly refer to the invention of Group I as comprising claims 1 – 5 and 70 – 78, whereas claim 77 was grouped with the invention of Group II.

Claims 6 – 19, 35, 36, 45 – 48, 50, 51 – 69, 77, and 79 – 89 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention; claims 20/7, 20/12, 20/17, and 21 – 26 are withdrawn from further consideration as being directed to a non-elected species, there being no allowable generic or linking claim.

An action on the merits of the elected invention follows.

Priority

Applicants have not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. §119(e) and §120 as follows:

An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification or in an application data sheet (37 CFR 1.78(a)(2) and (a)(5)). The specific reference to any prior nonprovisional application must include the relationship (i.e., continuation, divisional, or continuation-in-part) between the applications.

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Since the instant filing was not copending with prior provisional application serial number 60/030,962, benefit under §119(e) is only by way of prior non-provisional application serial number 08/972,464. Since Applicants have not satisfied the requirements of § 120, they are not entitled to the benefit of the earlier filing of either prior application.

Information Disclosure Statement

Applicants' I.D.S. filed September 8, 2003 has been fully considered. As a matter of course, all references cited during prosecution of prior application serial number 08/972,464 have been considered. However, unless these references are cited on examiner's form PTO-892, applicant's form PTO-1449, PTO/SB/08, or equivalent, the citations will not appear on the face of any patent issuing from the instant application.

Specification

The abstract of the disclosure is objected to because it appears as multiple paragraphs. The abstract should appear as a single paragraph, should not exceed 150 words, and should describe the invention to which the claims are now directed. Correction is required. See MPEP § 608.01(b).

Claim Objections

Claim 4 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claims 2 and 78 are objected to because of the following informalities:

In claim 2, the recitation "elements consisting of" should include a list of prospective elements, rather than a list of functions.

In claim 78, "said recording step (g)" should read "said recording step (f)". Appropriate correction is required.

Claim Rejections - 35 USC § 112

Claim 20/2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 20/2 is ambiguous as to whether the one or more substantially transparent elements must be phase-altering elements which are indentations in the object mask, or whether the one or more substantially transparent elements may still be selected from the group now consisting of phase-altering [elements] which are indentations in the object mask, scattering [elements], refracting [elements], and diffracting [elements]. There is no antecedent basis for "said one or more phase-altering elements".

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 5, 70, 71, 72, 74, and 75 are rejected under 35 U.S.C. 102(b) as being anticipated by Kojima, et al (U.S. Patent number 4,312,559). Referring *initially* to Figure 6 and the associated text, Kojima, et al disclose a method of fabricating an in-line holographic “mask” comprising the steps of:

a) providing an illumination source (LS) for generating a coherent illumination beam directed along an axis;

b) providing a non-opaque object mask (OX-L) capable of transmitting a portion of said illumination beam as undiffracted reference wavefronts (B), and having one or more substantially transparent elements (Bragg planes) for creating overlapping object wavefronts (A) when (*i.e.*, at the same time) said illumination beam is incident thereon;

c) disposing said object mask in said illumination beam;

d) providing a holographic recording medium (“K” in HR1) in said illumination beam in line optically with said object mask;

e) illuminating said object mask with said illumination beam and conjugate reference beam (B’), thereby causing said object mask to allow undiffracted reference wavefronts to pass therethrough, and causing said one or more substantially

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transparent elements to create object wavefronts which interact with said undiffracted reference wavefronts to create an interference pattern; and

f) recording said interference pattern in said holographic recording medium.

The resulting product is a "master" transparency (IN-L) to be placed within the path of a light beam (B) in the process of exposing a "slave" in-line lens (IN-L'), as shown in Figure 10. Thus, the product resulting from the process of Figure 6 fairly constitutes a "mask" within the specificity recited.

With regard to claims 2, and 5, Kojima, et al disclose the material of the non-opaque mask (OX-L) as being bichromated gelatin (Col. 7, lines 36+). It will be appreciated that the bichromated gelatin recording material, interferometrically exposed as shown in Figure 8 and developed as disclosed (Col. 8, lines 12-25), *inherently* contains an array of substantially transparent, diffracting elements commonly called Bragg planes. The elements are readily identifiable by their contrasting refractive indices.

With regard to claim 72, it is believed that substrate "HR1" in Figure 10 qualifies as a "durable substrate" within the specificity recited, since it is this substrate which is to be deployed for extended use in the final apparatus.

With regard to claim 75, the method results in a continuous diffracting region occupying the entire region of the recording material of HR1 illuminated during the exposure.

With regard to claim 74, insofar as the element (IN-L') of Figure 10 is later placed in the path of a light beam to alter the wavefronts issuing therefrom, it too,

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qualifies as a “mask” within the specificity recited. In this respect, Kojima, et al disclose method in Figure 10, the recited method of producing a “mask”, particularly wherein a *single* beam illuminates the non-opaque mask (IN-L). In this embodiment, the diffraction efficiency of the non-opaque mask (IN-L) is 50%, so as to result in a beam intensity ratio of 1:1, so as to anticipate the range recited in claim 74. If the product (IN-L') of Figure 10 cannot be regarded as a “mask” within the specificity recited (and the examiner urges it must, since in light of the instant specification, a “mask” can simply be a holographic lens), then the rejection relies upon the method of Figure 6. Since Kojima, et al disclose that the product (IN-L) of Figure 6 has a 50% diffraction efficiency for later use in Figure 10, and since the element was recorded in an on-axis geometry, then the examiner has reasonable belief that the intensity ratio of beams (A) and (B) in Figure 6 *inherently* is within the range between 0.1:1 and 100:1. If such is not the case, then Applicant should demonstrate that this feature is not inherent. *In re Swinehart*, 169 USPQ 226 (CCPA 1971).

With regard to claims 70 and 71, since Kojima, et al disclose that the product (IN-L) of Figure 6 has a 50% diffraction efficiency, the exposure time, exposure illumination, and developing of Kojima, et al have all been controlled in a manner that avoided “bottoming out” or “clipping”.

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Claims 1, 2, and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Lungershausen, et al (U.S. Patent number 5,258,863). Referring *for example* to the discussion of Figures 1 and 2, Lungershausen, et al disclose a method of fabricating an in-line holographic "mask" comprising the steps of:

a) providing an illumination source for generating a coherent illumination beam (24) directed along an axis;

b) providing a non-opaque object mask (16) capable of transmitting a portion of said illumination beam as undiffracted reference wavefronts (24), and having one or more substantially transparent elements (slit 18) for creating overlapping object wavefronts (14) when said illumination beam is incident thereon;

c) disposing said object mask in said illumination beam;

d) providing a holographic recording medium (26) in said illumination beam in line optically with said object mask;

e) illuminating said object mask with said illumination beam, thereby causing said object mask to allow undiffracted reference wavefronts to pass therethrough, and causing said one or more substantially transparent elements to create object wavefronts which interact with said undiffracted reference wavefronts to create an interference pattern; and

f) recording said interference pattern in said holographic recording medium.

The resulting product is to be placed within the path of a light beams (28)(30) to change the phase of wavefronts issuing therethrough as shown in Figure 10. Thus, the product

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resulting from the process of Figures 1 and 2 fairly constitutes a “mask” within the specificity recited.

With regard to claims 2 and 5, the designation “object beam” and “reference beam” is arbitrary in the geometry of Lungershausen, et al. Thus, the method may be regarded as one of illuminating a non-opaque mask comprising an array of transparent refracting elements (20)(22) creating object wavefronts and a slit (18) producing an undiffracted reference wavefront (14).

Allowable Subject Matter

Claims 3, 4, 73, 76, and 78 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 20/2 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art, taken alone or in combination, fails to teach or fairly suggest a method of fabrication a holographic mask comprising the *combination* of method steps

wherein the step of illuminating the object mask involves scanning said illumination beam over said object mask, as recited in claim 3;

wherein the one or more phase-altering elements are indentations in the object mask, thus, the method wherein the step of providing a non-opaque object mask

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involves providing an non-opaque object mask having indentations as phase-altering elements, as required by claim 20/2;

wherein the step of providing the non-opaque object mask includes providing a semi-transparent layer with an optical density between 0.1 an 5.0, as required by claim 73; or

wherein the step of providing the non-opaque object mask includes the photolithographic and etching steps recited in claim 76.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Edwards (U.S. Patent number 6,538,776) discloses a in-line holographic recording arrangement.

Nishiwaki, et al (U.S. Patent number 5,307,184) disclose a method and apparatus for recording an in-line holographic lens using a patterning mask.

Gilson (U.S. Patent number 4,835,088) was cited in parent application serial number 08/972,464, and discloses an opaque mask having transparent elements therein.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Juba whose telephone number is (571) 272-2314. The examiner can normally be reached on Mon.-Fri. 9 - 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Drew Dunn whose number is (571) 272-2312 and who can be reached on Mon.- Thu., 9 – 5.

The centralized fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for *all* communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2800.


JOHN JUBA, JR.
PRIMARY EXAMINER
Art Unit 2872

August 6, 2004